

# (12) United States Patent

Arment et al.

## (54) REFRIGERATION LINE SET FITTING AND METHOD OF USING THE SAME TO JOIN REFRIGERATION LINES TO EACH OTHER

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#### (56)**References Cited**

## U.S. PATENT DOCUMENTS

2/1969 Kish 3,429,587 A 3,596,939 A 8/1971 Gibson (Continued)

## FOREIGN PATENT DOCUMENTS

CA2751371 A1 8/2010 CN 201096243 Y 8/2008 (Continued)

## OTHER PUBLICATIONS

"Specification for Seamless Copper Tube", ASME Boiler and Pressure Vessel Code, Section II—Materials, 2004, American Society of Mechanical Engineers, http://app.knovel.com/hotlink/toc/ id:kpASMEBP06/asme-boiler-pressure/asme-boiler-pressure.

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### **ABSTRACT** (57)

A crimp fitting comprises a metal tube wall that forms both a cylindrical tube portion and an adjacent annular O-ring channel portion. The tube wall has a first wall thickness along the cylindrical tube portion and a second wall thickness along at least part of the O-ring channel portion. The second wall thickness is less than the first wall thickness. The cylindrical tube portion and O-ring channel are configured and adapted to encircle a cylindrical end portion of a tube when such end portion of the tube is inserted into the fitting.

## 12 Claims, 13 Drawing Sheets



